Divyansh Chhabria

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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2021 - Present	B.Tech.	Indian Institute of Technology Kanpur	9.50/10
2021	Class XII (CBSE)	Vindhyachal Academy, Dewas (M.P.)	95.8%
2019	Class X (CBSE)	Vindhyachal Academy, Dewas (M.P.)	97.4%

Scholastic Achievements

- Received **Academic Excellence Award** based on academic performance for **two consecutive years** *(2023 & 2022)*
- Secured **AIR 548 (CRL)** in **JEE Advanced 2021** and **AIR 1237 (CRL)** in **JEE Mains 2021** *(2021)*
- Qualified and recognized as **Madhya Pradesh State Topper** in **NSEC** & **NSEP 2021** by **HBCSE** *(2021)*
- Qualified **NSEA 2021** conducted by **IAPT** by securing a place among **top 250 candidates** nationwide *(2021)*
- Received **KVPY Fellowship** for **2 consecutive years** in **2021** and **2020** awarded by **IISc Bangalore** *(2021 & 2020)*
- Awarded the prestigious status of **NTSE Scholar** in **2019** by the **NCERT** among 1 million candidates *(2019)*
- Qualified **Regional Mathematics Olympiad 2019** securing a place among **top 30 candidates** from M.P. *(2019)*
- Qualified **Senior** & **Junior Science Olympiad** with **state rank 11** & **6** respectively conducted by **MPCST** *(2019 & 2017)*

Key Projects

Unified Portal for Hall Automation *(Jan'23-Apr'23)*
Course Project, Software Development & Operations, under Prof. Indranil Saha, CSE Department, IIT Kanpur

- Collaborated in a **10-member team** and developed a software for **digitalizing mess, canteen operations, bookings, and housekeeping services in the halls of residence at IIT Kanpur**, enhancing transparency and minimizing paperwork
- Followed **waterfall model**, documented **requirement specifications, design, implementation, testing,** and **user manual**
- Used **Figma, HTML** and **CSS** for frontend development and employed **Django Framework** for backend development, **unit-testing** with **Django-Test Framework** and **integration-testing** with **Selenium** attaining **test coverage** greater than **90%**

CSE Bubble *(Mar'23-Apr'23)*
Course Project, Computer Organization, under Dr. Urbi Chaterjee, CSE Department, IIT Kanpur

- Built **CSE Bubble processor** having **ISA** similar to **MIPS** with **single-cycle fetch, decode and execution of instructions**
- Designed and implemented the **Arithmetic Logic Unit (ALU)** in **top-down approach** to develop different **modules** for **R-type, I-type & J-type instructions** and the **finite state machine** for the **control signals** to execute the CSE Bubble
- Developed **MIPS code** for **Bubble Sort** algorithm, translated to **machine code** following the **ISA** and executed the processor

Uncovering the Mask of XORRO *(Jan'23-Feb'23)*
Course Project, Introduction to Machine Learning, under Prof. Purushottam Kar, CSE Department, IIT Kanpur

- Gave a **mathematical derivation** and showed that a **simple XORRO PUF** can be cracked by a **single linear model**
- Extended the **linear model approach** to break down an **Advanced XORRO PUF** composed of **16 XORROs** by utilizing **mathematically derived complete & consistent 1040-dimensional feature vectors** from **72-bit challenge vectors**
- Achieved remarkable **train accuracy** of **99.82%** and **test accuracy** of **99.2%** using the **LinearSVC model** with **L1 penalty**

Playing With the Melbot *(Mar'23-Apr'23)*
Course Project, Introduction to Machine Learning, under Prof. Purushottam Kar, CSE Department, IIT Kanpur

- Developed a **decision tree algorithm** to guess a **secret word** from a **5167-word dictionary** allowing **15 trials** at maximum
- Used **greedy algorithm** to determine an **optimal query word** at each node of the tree to **maximize the child nodes** formed
- Achieved **100%** accuracy with **fast 0.23s train time**, **compact 1.5 MB model size**, and **3.7 average queries per round**

Learning Biology through Case Studies of Discoveries *(Aug'22-Nov'22)*
Mentor: Prof. Ashwani Thakur, Biological Sciences and Bioengineering, IIT Kanpur

- Reviewed and **summarized research papers** by Nobel Laureates on **genetic information transfer** and **DNA replication**
- Studied **decoding of genetic code** through **articles**, **research papers**, and **transcribed interviews** by renowned scientists

Animating Concepts Using Python (Mentor: Dr. Raj Dandekar, Ph.D., CSE department, MIT) *(Oct'22-Nov'22)*

- Mastered **Manim library**, employing **Python**, for engaging & informative visual representations of **mathematical concepts**
- Created **34 animated concept videos** on **Trigonometry** and **Surface Areas & Volumes** for in-depth **visual learning**

Technical Skills

Programming: C, C++, Python, Verilog HDL, MIPS Assembly Language, Bash **Web:** Django, Javascript, CSS, HTML

Utilities & Frameworks: Numpy, Pandas, Matplotlib, Seaborn, Manim, Figma, QtSpim, Selenium, Git/GitHub, LaTeX, Vim

Relevant Courses

Software Development and Operations	Introduction to Machine Learning	Introduction to Electronics
Computer Organization	Data Structures and Algorithms	Real Analysis
Probability for Computer Science	Discrete Mathematics	Linear Algebra
Logic for Computer Science	Fundamentals of Computing	Ordinary Differential Equations